Pre-qualified Composite Column Jacket System

Last updated June 25, 2004

	System Identification	Circular Column Shape*	Rectangular Column Shape*
System 1 E-Glass	SEH 51/TYFO S	Fyfe Co. LLC 6044 Cornerstone Court, Suite C San Diego, CA 92121-4730 (858) 642-0694 (858) 642-0947 fax	Fyfe Co. LLC 6044 Cornerstone Court, Suite C San Diego, CA 92121-4730 (858) 642-0694 (858) 642-0947 fax
	HEX 3R Wrap 107/HEX 3R Epoxy 300	Hexcel Schwebel Corporation 2200 South Murray Ave. Anderson, SC 29624 (864) 260-6593	Hexcel Schwebel Corporation 2200 South Murray Ave. Anderson, SC 29624 (864) 260-6593
System 2 Carbon	XxSYS AS4D/M10E	Xxsys Technologies, Inc. 8240 Miramar Road San Diego, CA 92126 (858) 566-3222 ext. 226 (858) 566-0228 fax	Xxsys Technologies, Inc. 8240 Miramar Road San Diego, CA 92126 (858) 566-3222 ext. 226 (858) 566-0228 fax
System 3 E-Glass	DuPONT E-GLASS/VINYL ESTER	Hardcore Composites	Hardcore Composites

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System 4 E-Glass	SNAP TITE	CCMyers Inc.	
System 6 Carbon	REPLARK 30/L700S-LS	Mitsubishi Carbon Epoxy System 580 Broadway, Suite 1202 New York, New York 10012 (212) 274-0375	Mitsubishi Carbon Epoxy System 580 Broadway, Suite 1202 New York, New York 10012 (212) 274-0375
System 5 Carbon	MBrace CF130	Master Builder Inc. Watson Bowman 95 Pineview Dr. Amherst, NY 14228 (800) 253-9226	Master Builder Inc. Watson Bowman 95 Pineview Dr. Amherst, NY 14228 (800) 253-9226
System 7 Carbon	UT70-30/L700S-LS	Toray Carbon Epoxy System 580 Broadway, Suite 1202 New York, NY 10012 (212) 274-0375	Toray Carbon Epoxy System 580 Broadway, Suite 1202 New York, NY 10012 (212) 274-0375
System 8	VELCARB 335u/VELOXX LR	Edge Structural Composites 2308 South 51st Street Richmond, CA 94804 (510) 233-8654	

The above fiber reinforced polymer (FRP) composites column casings systems have undergone laboratory testing and are approved for use in limited situations. The FRP composite column casing thicknesses, as shown on the Standard Drawings, are designed to enhance both the shear capacity and increase the lateral confinement of the plastic hinge zone for bridge columns with poor transverse reinforcement details. Material testing standards and provisional specifications have been developed to allow limited field installations for both E-glass and carbon fiber composites, under strict conditions.

* The FRP composites column systems shall be specified as an alternative column casing if conditions below are satisfied:

1. Displacement ductility demand not more than 6 for circular columns and not more than 3 for rectangular columns. It may be permissible to use advanced composites on circular columns with ductility demands approaching 8, with the written approval of the Earthquake Engineering Branch and the Design Supervisor.

2. For rectangular columns, the longest dimension is limited to a maximum of 36 inches. Rectangular column sides aspect ratio shall not be greater than 1.5.

3. For circular columns, the diameter must be 72 inches or less.

4. Lap splices are not existing in expected plastic hinge zones.

5. Composites shall not be used for single column bent structures.

6. The total axial load (dead load + overturning) is not greater than $0.15\ f'_c A_g$.

7. The columns longitudinal reinforcement ratio is not greater than 2.5%.

8. The bridge does not require flame-sprayed plastic.

9. The columns must be prismatic in shape.

10. The extent of the region designated as t_l shown on the Standard Drawing shall not be less than 1 ½ times the column diameter or to where the moment has decreased to 75% of the maximum moment.

Questions on the above should be directed to:

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Engineering Services, Office of Earthquake Engineering
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Sacramento, CA 95816